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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/711,003

08/17/2004

Jason Lu

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5002

31561

7590

03/09/2006

EXAMINER

GARCIA, JOANNIE A

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 03/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/711,003	Applicant(s) LU	
	Examiner Joannie A. Garcia	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 6-8 is/are rejected.
- 7) ☒ Claim(s) 3-5 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

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Claims 1-8 are objected to because of the following informalities:

In claim 1, line 2, “reducing wafer” after “for reducing wafer scratch”, should be deleted.

In claim 1, line 3, “scratch” before “comprising the steps of:”, should be deleted.

In claim 1, line 10, “reducing” before “a step”, should be replaced with --reduce--.

In claim 1, line 11, “compared” before “that without adjusting”, should be followed by --to--.

Claim 3 recites the limitation "laser beam" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim.

In claim 6, line 2, “wafer” after “for reducing” should be preceded by --a--.

In claim 6, line 2, “scratchprocess” after “for reducing” should be replaced with --scratch process--.

In claim 7, line 1, “wherein” should be followed by --a--.

Claim 7 recites the limitation "laser beam" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 8 recites the limitation "step of controlling" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1 and 2 are rejected under 35 U.S.C. 102(a) as being anticipated by Chung et al (US 2003/0203589 A1).

Chung et al discloses providing a substrate 10 (Figure 1), and performing a processing operation over a surface of the substrate prior to performing a chemical mechanical polishing process, wherein at least a protrusion is formed over the surface of the substrate during the processing operation, and wherein a parameter of the processing operation is adjusted in a manner to reduce a step height of the protrusion compared that without adjusting the parameter of the processing operation (Figures 1-2, and Paragraphs 0012-0015), wherein the processing operation comprises a laser marking process (Paragraph 0013).

Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chung et al (US 2003/0203589 A1), in combination with Fang et al (US 2005/0158966 A1), and the following comments.

Chung et al discloses fabricating a shallow trench isolation comprising providing a substrate 10 (Figure 1), performing a laser marking operation to form a laser mark 20 on the substrate (Figure 2), wherein at least a protrusion is formed during the laser marking operation due to an amassment of material, and wherein a parameter of the laser marking operation is adjusted in a manner to reduce a step height of the protrusion compared to that without adjusting the parameter (Paragraphs 0012-0014), forming a patterned mask layer 12/14 over the substrate (Figure 2), etching the substrate using the patterned mask layer as an etching mask to form a trench 22 (Figure 3).

Chung et al discloses the claimed invention except for forming an insulation layer over the substrate, wherein the insulation layer completely fills the trench, removing a portion of the insulation layer by performing a chemical-mechanical polishing process, and removing the patterned mask layer. Fang et al discloses fabricating a shallow trench isolation including forming a patterned mask layer 26 over a substrate 22 (Figure 2A, and Paragraph 0020), etching the substrate using the patterned mask layer as an etching mask to form a trench 30A (Figure 2C, and Paragraph 0022), forming an insulation layer 31 over the substrate, wherein the insulation layer completely fills the trench (Figure 2D, and Paragraph 0023), removing a portion of the insulation layer by performing a chemical-mechanical polishing process (Figure 2H, and Paragraph 0027), and removing the patterned mask layer 26 (Figures 2C-2D). It would have been within the scope of ordinary skill in the art to combine the teachings of Chung et al and Fang et al, to achieve formation of a CMP insulation layer filling the trench 22 of Chung et al, and removal of patterned mask layer 12/14 of Chung et al, by employing the disclosed steps of Fang et al.

Chung et al discloses the claimed invention except for adjusting the energy to a level below 1000 micro Joule, and reducing the step height to a level below 4 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine a suitable energy and step height, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

In addition, the selection of a suitable energy and step height, it's obvious because it is a matter of determining optimum process conditions by routine experimentation with a limited

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number of species of result effective variables. These claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996)(claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill or art) and In re Aller, 105 USPQ 233 (CCPA 1995) (selection of optimum ranges within prior art general conditions is obvious).

Note that the specification contains no disclosure of either the critical nature of the claimed energy and step height or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen energy and step height or upon another variable recited in a claim, the Applicant must show that the chosen energy and step height are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Claims 3-5 would be allowable if rewritten to overcome the objection(s) set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joannie García whose telephone number is (571) 272-1861. The examiner can normally be reached on Monday through Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



JAG

March 4, 2006

GFourson
Primary Examiner



George Fourson
Primary Examiner
Art Unit 2823